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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,334	10/18/2001	Ashay A. Dani	042390.P12141	7280

7590 08/04/2004

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EXAMINER

AHMED, SHEEBA

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 08/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/038,334	DANI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Sheeba Ahmed	1773	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 May 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 and 15-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Response to Amendment***

1. No amendments have been made to the claims in the Response filed on May 17, 2004 in the above-identified application. **Claims 1-13 and 15-30 are pending.**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-13 and 15-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (US 5,062,896) in view of Hanrahan (US 5,945,217).

Huang et al. disclose interconnection materials for forming connections between electroconductive members (Column 1, lines 6-10) and comprising metal alloy powder and polymer paste wherein the polymer is heat softenable above the melting temperature of the metal solder particle filler (Column 1, lines 43-53). The preferred compositions comprise polyimide siloxane binder material and bismuth-tin alloys having a melting temperature in the area of 138°C (Column 1, lines 67-68, Column 2, lines 1-10 and Column 3, lines 30-34). The composition comprises between 85 and 95% by weight of metal alloy powder (Column 3, lines 15-20).

Huang et al. do not specifically state that metal alloy powder/polymer paste further comprises filler particles or that the size of the bismuth-tin alloy particles is between 0.2 and 100 microns.

However, Hanrahan discloses a thermally conductive article comprising a matrix material with thermally conductive particles and a phase change material wherein preferred thermally conductive particles include Al, Cu, Ni, Ag, or Zn (Column 2, lines 31-45). Hanrahan's thermally conductive article can be mounted between a heat sink and an integrated circuit device and provides an interface with exceptional conformability between the component parts (Column 3, lines 33-40). The thermally conductive particles can be present in proportions of at least 20 to 99 weight percent (Column 4, lines 36-45).

Accordingly, it would have been obvious to one having ordinary skill in the art to add thermally conductive particles, such as Al particles, to the metal alloy powder/polymer paste taught by Huang et al. given that Hanrahan specifically teach that such particles increase the thermal conductivity of the material and provide an interface with exceptional conformability between the component parts. Furthermore, it would have been obvious to one having ordinary skill in the art to optimize the size of the bismuth-tin alloy particles given that the size of the solder particles would affects the rate of melting of these particles.

***Response to Arguments***

3. Applicant's arguments filed on May 17, 2004 have been fully considered but they are not persuasive. Applicants traverse the rejection of claims 1-13 and 15-30 under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (US 5,062,896) in view of Hanrahan (US 5,945,217) and submit that one skilled in the art would not combine Huang and Hanrahan because the materials of Huang and Hanrahan serve a different purpose and the material requirements are opposite to one another. Applicants further allege that the material of Huang should be flowable because it is used for electrical contacts whereas the material of Hanrahan should be stable.

The Examiner disagrees. Although the interconnection materials taught by Huang are used to form connections between electroconductive members these materials are not necessarily a flowable material. In fact, the Applicants fail point to any specific disclosure by Huang that states that their interconnection material must be flowable and the Examiner was unable to find any such teaching by Huang. Hence, the above rejection is maintained.

***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheeba Ahmed whose telephone number is (571)272-1504. The examiner can normally be reached on Monday-Friday from 9am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (571)272-1516. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.



Sheeba Ahmed

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July 30, 2004